

**A REVISION OF *PODOTHECA* Cass. (ASTERACEAE:
INULEAE: GNAPHALIINAE)**

by

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ABSTRACT

Short, P. S. A revision of *Podotheca* Cass. (Asteraceae: Inuleae: Gnaphaliinae). *Muelleria* 7(1): 39–56 (1989). The endemic Australian genus *Podotheca* Cass. is revised. Six species are recognized and three of them, *P. pritzelii* P. S. Short, *P. unisetata* P. S. Short and *P. wilsonii* P. S. Short are described as new. *P. fuscescens* (Turcz.) Benth. and *P. pollockii* (F. Muell.) Diels are excluded from the genus.

GENERIC HISTORY

CONSERVATION OF THE NAME *PODOTHECA* CASS

Labillardière (1806) described and named for the first time the genus *Podosperma* Labill. He attributed a single species, *P. angustifolia* Labill., to the genus and based his description on material gathered in Western Australia. The previous year the name *Podospermum* DC. (1805) had been erected. Both names apply to different genera of the Compositae and with the similarity of the names confusion soon reigned. Lessing (1832) incorrectly spelt *Podospermum* DC. as '*Podosperma*' and this mistake was perpetuated by Kunth (1838) and Schultz (1834). Prior to the aforementioned mistake Cassini (1822) had erected the name *Podotheca* Cass., indicating that it was the equivalent of *Podosperma* Labill. No reason for the name change was given and the required new combination for the species was not made. Four years later Cassini (1826) suggested that the name *Phaenopoda* Cass. be adopted instead of *Podosperma* and *Podotheca*. Lessing (1832) adopted the name *Podotheca* and effected the combination *Podotheca angustifolia* (Labill.) Less.

Graham (1842) described *Podotheca gnaphalioides* Grah. and Steetz (1845) also adopted the name *Podotheca*. Bentham (1867) followed suit and in citing generic synonyms referred to *Lophoclinium* Endl. (1843), *Phaenopoda* Cass. and '*Podospermum* Labill.'

Podosperma Labill., not *Podotheca* Cass., was subsequently used by many authors (e.g. Mueller 1882, 1889 — as '*Podospermum*'; Ewart 1931, Black 1957; Curtis 1963). Others (e.g. Hoffman 1894; Rodway 1903; Maiden & Betche 1916) retained *Podotheca*.

Because of the confusion that had occurred with both *Podospermum* DC. and *Podosperma* Labill. Eichler (1964) proposed that the name *Podotheca* be conserved against *Podosperma* Labill. [Submittance of this proposal was partly influenced by the recognition in Australia of species referable to *Podosperma* and *Podospermum*, the latter being represented by the weed *P. laciniatum* (L.) DC. It now seems that *Podospermum* is generally considered to be synonymous with *Scorzonera* L.] The Committee for Spermatophyta (1967) reported that in their opinion *Podosperma* Labill. should be regarded as illegitimate (Art. 75) due to the similarity to *Podospermum* DC., thus making the conservation of *Podotheca* unnecessary. However, it was also felt that, as Art. 75 and the examples cited within left the question of the legitimacy of *Podosperma* open to dispute, it was in the interests of nomenclatural stability to recommend conservation of *Podotheca* against *Podosperma*. The General Committee of Botanical Nomenclature (1968) approved the proposal.

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GENERIC DELIMITATION

Prior to Bentham's (1867) account of *Podotheca* three species had been referred to the genus, i.e. *P. angustifolia*, *P. gnaphalioides* and *P. pygmaea* A. Gray (1851). Bentham transferred two further species, *Ixiolaena chrysantha* Steetz and *Helipterum fuscescens* Turcz., to *Podotheca*. He noted that 'the genus is limited to Australia, differing from *Helipterum* chiefly in the stipitate achenes, and generally in the involucre, which however is less foliaceous in *P. fuscescens* than in the other species' (Bentham 1867, p. 601). Mueller (1882) retained the name *Podosperma* in preference to *Podotheca* and described a further new species, *P. pollackii* F. Muell. In the same publication he suggested that *P. fuscescens*, because of the outer scarious bracts of the involucre, should again be returned to *Helipterum*. Diels (1904) effected the combination *Podotheca pollackii* (F. Muell.) Diels.

Despite Mueller's comment that *P. fuscescens* be referred to *Helipterum* the species is commonly retained in *Podotheca*. All species of *Podotheca* occur in Western Australia and Grieve & Blackall (1975) recognized six species, i.e. *P. angustifolia*, *P. chrysantha*, *P. fuscescens*, *P. gnaphalioides*, *P. pollackii* and *P. pygmaea*. In this revision *P. fuscescens* and *P. pollackii* are excluded from *Podotheca s. str.*, three further species (*P. pritzelii*, *P. uniseta* and *P. wilsonii*) are described as new, and *P. pygmaea* is reduced to synonymy under *P. angustifolia*.

Merxmüller *et al.* (1977) referred *Podotheca* to their 'group 16' or 'Schoenia group' of the Gnaphaliinae *sensu amplo*. This group is characterized by the triangular hairy appendage of the style arms and includes some members of Australian *Helichrysum* Miller and *Helipterum* DC. plus genera such as *Millotia* Cass. and *Waitzia* Wendl. *Podotheca s. str.* is readily distinguished from other members of this group by the involucre bracts, which are arranged in several series with the outer ones leaf-like, the pappus of usually one, five or ten bristles and the long, bisexual florets of the large capitula. The fruit has a prominent stipe (Fig. 2a) but this feature is not exclusive to species of *Podotheca s. str.* Chromosome number determinations by Turner (1970) suggest a base number of $x = 13$ for the genus.

Podotheca fuscescens is excluded from *Podotheca s. str.* on a number of grounds. The involucre bracts are quite dissimilar to those of *Podotheca s. str.* The outer leaf-like bracts are few in number and the inner bracts have white, opaque tips which are absent in species of *Podotheca s. str.* Other differences occur in the style appendages, which are more or less truncate and long papillate, and the pappus of c. 12–14 plumose bristles. *P. fuscescens* has strong affinities with *Helipterum oppositifolium* S. Moore and *H. strictum* (Lindl.) Benth. (P. G. Wilson, *in litt.*, 1987).

Podotheca pollackii is readily distinguished from members of *Podotheca s. str.* by virtue of the spike-like arrangement of the capitula. As with *H. fuscescens* the involucre bracts of this species differ from those in *Podotheca s. str.* and the fruit are anatomically different. In *Podotheca s. str.* the vascular bundles of the pericarp are oblique to the cotyledons and the sclerenchymatous layer in the pericarp is mainly one cell wide. In *P. pollackii* the vascular bundles are in the plane of the adaxial surface of the cotyledons and the sclerenchymatous layer is 2–4 cells wide. Unlike members of *Podotheca s. str.* fresh specimens produce a fetid odour when the leaves are crushed and the anthers are black. The style and anther morphology suggest the retention of *P. pollackii* in the 'Schoenia group'. Its strongest affinities are with *Helipterum battii* F. Muell., *H. charslleyae* F. Muell. and *H. spicatum* (Lindl.) Benth. (P. G. Wilson, *in litt.*, 1987).

MATERIALS AND METHODS

Descriptions of taxa were made from dried herbarium material and from specimens stored in 70% ethanol. Shapes were defined using the terms given by the Systematic Association Committee for Descriptive Terminology (1962).

Specimens were examined from the following herbaria: AD, BM, E, K, LD, MEL, PERTH, S and W.

Pollen:ovule ratios (P/Os) were obtained following the method previously outlined (Short 1981). In all but *P. chrysantha* P/Os were obtained on a population basis, the number of pollen grains being determined for at least 15 florets, with each floret sampled from different plants. Measurements pertaining to anther characteristics (see Short 1985, fig. 1) were also obtained on a population basis.

Fruit sections were obtained following the fixation of dry, mature fruit with 5% glutaraldehyde in Pipes buffer (O'Brien & McCully 1981) and the subsequent infiltration and embedding in L. R. White (London Resin Co.). Sections were stained in toluidine blue (pH 4.5).

TAXONOMY

Podotheca Cass., Dict. Sci. Nat. 23: 561 (1822), *nom. cons.*; Less., Syn. gen. Compos. 272 (1832); DC., Prod. 6: 159 (1838); Steetz in Lehm. Pl. Preiss. 1: 448 (1845); Benth., Fl. Austr. 3: 600 (1867) p.p., excluding *P. fuscescens*; Benth. in Benth. & Hook. f., Genera Pl. 2: 315 (1873) p.p.; Hoffman in Engler & Prantl., Naturl. Pflanzenfam. IV(5): 190 (1890); Eichler, Regnum Veg. 34: 62 (1964); Taxon 16: 229 (1967); Grieve & Blackall, W. Aust. Wildfls 824 (1975); Cooke in Jessup & Toelken, Fl. S. Aust. 3: 1573 (1986); Lander in Marchant *et al.*, Fl. Perth Region 699 (1987). — *Podosperma* Labill., Nov. Holl. Pl. Sp. 2: 35, t. 177 (1806); J. M. Black, Fl. S. Aust. 1st ed. 636 (1929), 2nd ed. 914 (1957); W. M. Curtis, Stud. Fl. Tas. 341 (1963); J. H. Willis, Handb. Pl. Vict. 2: 719 (1973). — *Phaenopoda* Cass., Dict. Sci. Nat. 42: 84 (1826), *nom. illeg.* TYPE: *Podotheca angustifolia* (Labill.) Less.

Lophoclinium Endl., Bot. Zeitung (Berlin) 1: 457 (1843), p.p. excluding *L. album*.

LECTOTYPE: Not chosen, see note 2 under *P. angustifolia*.

Annual herbs. Major axes decumbent to erect, sometimes cottony, with flat, septate hairs and/or glandular hairs. Stem simple or forming major branches at basal and/or upper nodes. *Leaves* mainly alternate but the lowest pair(s) opposite, all leaves sessile, sometimes succulent, entire, leaf bases \pm decurrent, all leaves with flat, septate, non-glandular hairs usually mixed with glandular hairs. *Capitula* homogamous, ovoid to lanceoloid or obovoid to very broadly obovoid or \pm oblong. *Involucral bracts* 14–c. 60, multiseriate, the outermost leaf-like, the inner mainly hyaline. *Receptacle* flat or concave, glabrous, base of pedicels prominent. *Florets* c. 10–300 per capitulum, all tubular, bisexual, 5-merous; style appendix triangular, papillose; stamens 5, anthers tailed and each with a sterile, apical appendage. *Cypselas* homomorphic, obovoid, pubescent; pericarp with a layer of sclerenchyma which is usually one cell wide but sometimes two cells wide around the two vascular bundles, the bundle orientation medial or oblique; testa of 2 \pm distinct layers, the outer with crystals, vascular bundles absent; endosperm one cell wide; carpopodium oblique; pedicel or stipe prominent. *Pappus* usually of 1, 5 or 10 bristles c. the length of the corolla tube, bristles barbellate to plumose, joined at the base.

Chromosome numbers: $n = 13, 26$.

DISTRIBUTION (Fig. 1):

All six species occur in Western Australia and five are endemic to that state. *P. angustifolia* extends across the southern part of the mainland and reaches islands in Bass Strait. Three species in Western Australia seem to only occur on the margins of salt lakes. Two, *P. pritzelii* and *P. uniseta*, are restricted to the Avon Lake system and the Monger Lake system respectively (Bettenay & Mulcahy 1972; Mulcahy & Bettenay 1972). (Lake Moore, as suggested in 1973 by Beard, is considered to belong to the Monger system.) In contrast *P. wilsonii* occurs in three different Drainage Divisions, the Murchison, South-West and Eucla Divisions (Mulcahy & Bettenay *l.c.*).

REPRODUCTIVE BIOLOGY, CYTOLOGY AND EVOLUTION:

The use of pollen:ovule ratios (P/Os) in the determination of plant breeding systems has been previously discussed (Short 1981). The values obtained for five of the six species of *Podotheca*, ranging from one to several thousand (Table 1), suggests that

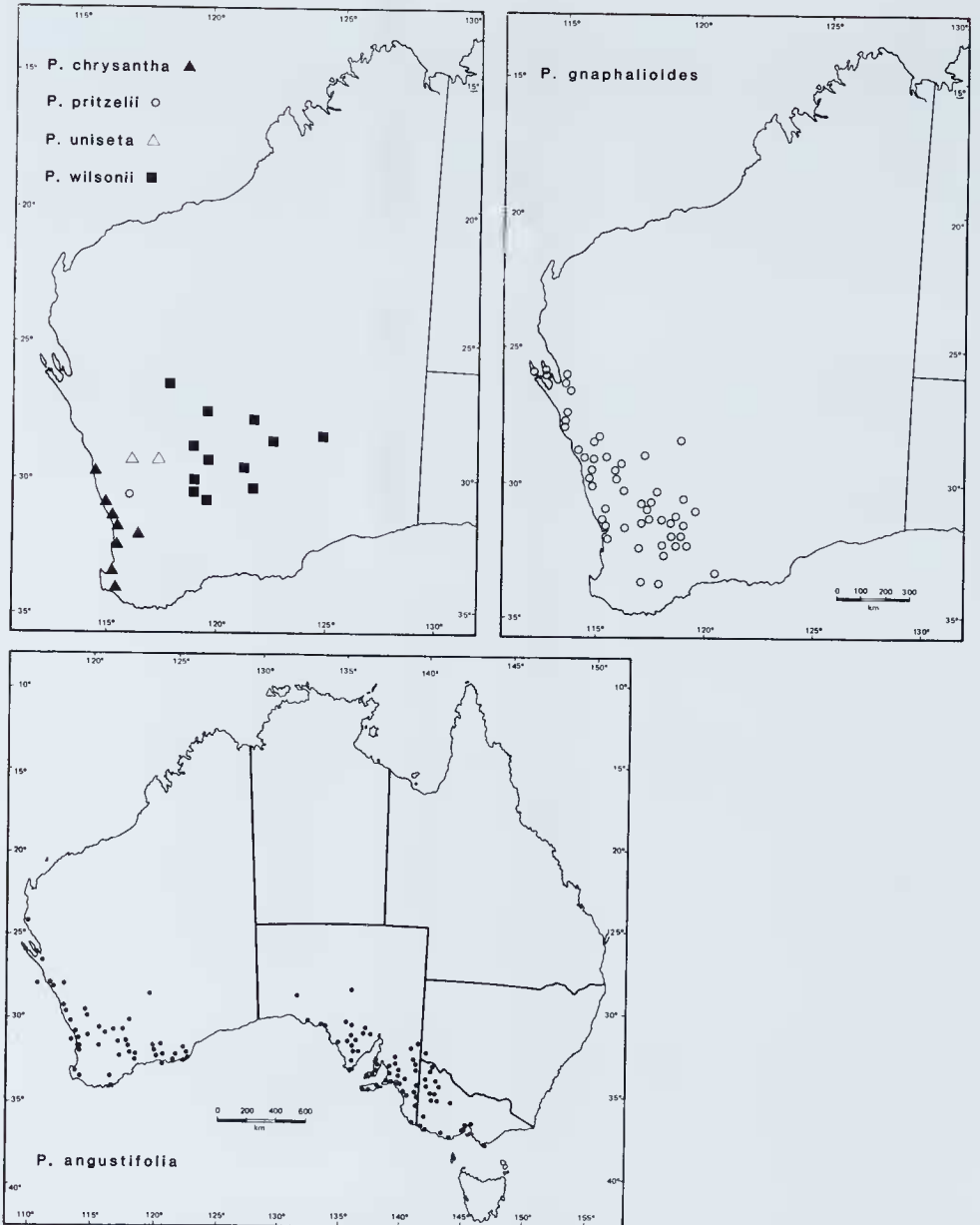


Fig. 1. Distribution of species of *Podotheca*.

they are outbreeders (i.e. cross-fertilization is common). In contrast *P. angustifolia*, with an average P/O of 184, is considered to be an inbreeder (i.e. self-fertilization is common). The low P/O in *P. angustifolia* is correlated with inconspicuous florets, compared to other species of *Podotheca*, and small anthers (Table 1).

Chromosome number determinations are only available for three of the six species (Table 1). All were recorded by Turner (1970) and suggest a base number of $x = 13$ for the genus. That polyploidy is recorded in *P. angustifolia* and no other species is not surprising when it is considered that it is the only one classed as an inbreeder.

Table 1. Pollen:ovule ratios (P/Os), anther characteristics, chromosome numbers and the number of pappus bristles in species of *Podotherca*. Minimum, maximum and averages values are shown where applicable.

| Species | P/O | Total anther length (mm) | Length of microsporangia (mm) | Length of terminal anther appendage (mm) | No. of pappus bristles | Chromosome number (n) |
|-------------------------|---------------------|--------------------------|-------------------------------|--|------------------------|-----------------------|
| <i>P. angustifolia</i> | 98-270 (184) | 0.65-1.15 (0.92) | 0.33-0.82 (0.59) | 0.23-0.46 (0.32) | 5 | 13, 26 |
| <i>P. gnaphalioides</i> | 1654-3554 (2480) | 1.24-2.61 (2.27) | 1.37-2.14 (1.78) | 0.37-0.66 (0.5) | 5 | 13 |
| <i>P. pritzelii</i> | 1820-2024 (1872) | 1.4-1.83 (1.59) | 1.05-1.46 (1.22) | 0.35-0.43 (0.38) | 5 | — |
| <i>P. uniseta</i> | 1490-2896 (1891) | 1.35-1.94 (1.59) | 0.97-1.59 (1.24) | 0.28-0.49 (0.35) | 1 | — |
| <i>P. chrysantha</i> | 2320-3382 (2816) | 1.74-2.24 (1.94) | 1.24-1.77 (1.48) | 0.39-0.52 (0.46) | (8)10(12) | 13 |
| <i>P. wilsonii</i> | 1816-3678 (2863) | 1.96-2.46 (2.14) | 1.45-1.88 (1.6) | 0.35-0.62 (0.54) | 5 | — |

By virtue of the shape of the capitulum two groups can be discerned within *Podotheca*. Thus *P. chrysantha* and *P. wilsonii*, with obovoid to very broadly obovoid (rarely \pm oblong) capitula, are readily distinguished from all other species which have ovoid or narrowly ovoid capitula. The dense vestiture of stalked, glandular hairs on the bracts also suggests that *P. chrysantha* and *P. wilsonii* are more closely related to one another than other species in the genus although such a vestiture does occur in a few specimens of *P. gnaphalioides*. The four remaining species are closely related, with three (*P. gnaphalioides*, *P. pritzelii* and *P. uniseta*) mainly differing in the number of pappus bristles, the presence or absence of succulent bracts and the distribution of septate hairs. Ecological differences also exist, with *P. uniseta* and *P. pritzelii* occurring in more saline habitats than *P. gnaphalioides*. (For further notes on morphological and ecological differences see under treatment of species.) *P. angustifolia*, although clearly having strong affinities with the preceding three species, is readily distinguished by virtue of its inbreeding nature, correlated as it is with small florets and anthers. The widespread occurrence of *P. angustifolia* is consistent with the distribution observed for many other inbreeding species of the Inuleae (Short 1981).

On several previous occasions (Short 1981, 1986) attention has been drawn to the importance of the salt lake systems of south-west Western Australia to speciation in a number of inuloid genera. The apparent restriction of *P. pritzelii* and *P. uniseta* to separate lake systems further highlights their importance.

KEY TO SPECIES OF PODOTHECA

1. Pappus bristles 5 per floret
 2. Capitula obovoid to very broadly obovoid, rarely \pm oblong; outer involucrel bracts with stalked, glandular hairs not flat, septate hairs; pappus bristles usually white or pale yellow but sometimes the upper part pink 2. *P. wilsonii*
 2. Capitula ovoid to narrowly ovoid; bracts glabrous or with flat, septate hairs, sometimes with stalked glandular hairs; pappus bristles white or pale yellow, never pink
 3. Florets inconspicuous, barely exerted above the bracts; anthers 0.4–1.15 mm long 6. *P. angustifolia*
 3. Florets conspicuous, exerted well beyond the bracts; anthers 1.24–2.61 mm long
 4. Leaves and bracts at most semi-succulent, dark green or purple; glandular hairs usually present on major axes; outer involucrel bracts usually with septate hairs, rarely glabrous 3. *P. gnaphalioides*
 4. Leaves and bracts succulent, pale-green, rarely purplish; glandular hairs absent from major axes; outer involucrel bracts glabrous . 4. *P. pritzelii*
1. Pappus bristles not 5 per floret
 5. Pappus bristles 1 per floret 5. *P. uniseta*
 5. Pappus bristles (9)10(11) per floret 1. *P. chrysantha*

1. *Podotheca chrysantha* (Steetz) Benth., Fl. Austr. 3: 602 (1867); Grieve & Blackall, W. Aust. Wildfls 824 (1975); Lander in Marchant *et al.*, Fl. Perth Region 700 (1987). — *Ixiolaena chrysantha* Steetz in Lehm., Pl. Preiss. 1: 459 (1845). — *Podosperma chrysantha* (Steetz) F. Muell., Fragm. 12: 22 (1882). TYPE: 'In arenosis sylvae prope oppidulum Perth, d. 23. Sept. 1839. Herb. Preiss. No. 105'. LECTOTYPE (here chosen): Preiss 105, In Nova Hollandia (Swan River Colonia), in arenosis sylvae prope oppidulum Perth, s. dat. (MEL 1553907, ex herb. Steetz). ISOLECTOTYPES: GH, LD, MEL 1553905 (ex herb. Sonder), MEL 1553906 (ex herb. Sonder), MEL 1543871, P (three sheets, one ex herb. E. Drake, one ex herb. Schultz-Bip.), S, W (three sheets). (See note 1 below.)

Annual herbs. Major axes erect, 6–35 cm long, with stalked, glandular hairs, brown or brown purple. *Leaves* lanceolate or \pm linear, 0.5–8.5 cm long, c. 0.1–0.65 cm wide, apex often incurved, with stalked, glandular hairs, green. *Capitula* obovoid to very broadly obovoid, 1–2.5 cm long, 0.4–3 cm diam. *Involucrel bracts* 14–55 per

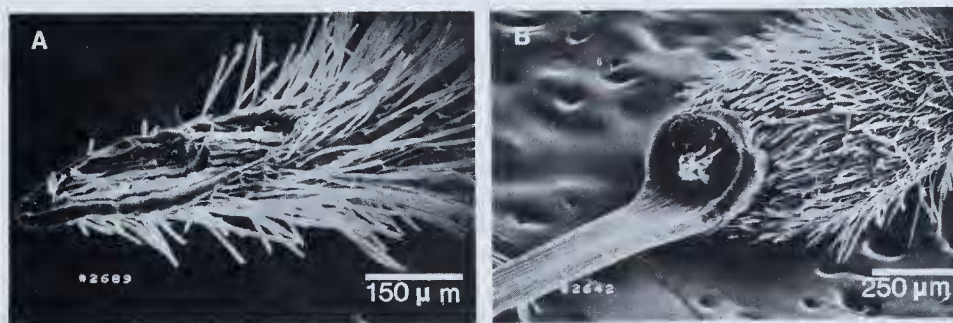


Fig. 2. a — Carpopodium of *P. angustifolia* (Short 2689). b — Apex of fruit of *P. unisetata* showing the single pappus bristle (Short 2642).

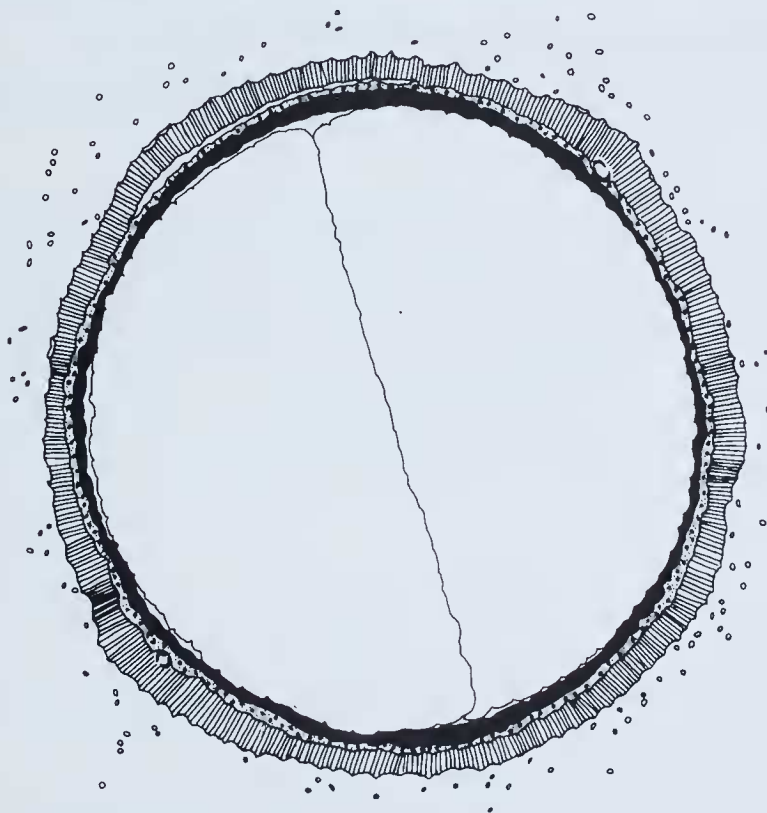


Fig. 3. Transverse section of fruit of *P. angustifolia* (Short 2689). Sclerenchyma = hatching, testa = dots, endosperm = black shading.

capitulum, narrowly elliptic, lanceolate, oblanceolate, narrowly obtrullate or narrowly to linear triangular, 6.5–14 mm long, 0.8–4.2 mm wide; outer bracts herbaceous, the surface with stalked, glandular hairs, sometimes with narrow hyaline margins with long-ciliate hairs; inner bracts hyaline except for an opaque midrib, glabrous or with long-ciliate hairs on the margins. *Florets* 10–320 per capitulum, yellow; corolla tube 7.5–12.5 mm long. *Stamens* 5; anthers 1.74–2.24 mm long; microsporangia 1.24–1.77 mm long; apical appendages 0.39–0.52 mm long. *Pollen grains* c. 500–600 per anther. *Cypselas* 2.3–3 mm long, 0.6–0.9 mm diam. *Pappus* bristles (9–)10(–11), smooth near the base, otherwise barbellate.

Chromosome number: $n = 13$ (Turner 1970).

DISTRIBUTION (Fig. 1):

Western Australia between latitudes *c.* 29° 30' S. and 35° S. and west of longitude *c.* 117° E. A collection by Oldfield (K) is labelled as coming from the Murchison River but this seems to be erroneous.

ECOLOGY:

Favours sandy soil. Collectors' notes include 'low woodland . . . of *Banksia*, ridge of light yellow sand', '*Banksia* - coastal Blackbutt association' and 'closed heath, shallow sand over limestone on ridge'. Flowers from late August to December.

NOTES:

1. The selection of MEL 1553907 as the lectotype of *Ixiolaena chrysantha* is consistent with the argument previously put (Short & Sinkora 1988) that in the case of names originally coined by Steetz that specimens in his own herbarium should generally be chosen as lectotypes.

SELECTED SPECIMENS EXAMINED (Total *c.* 50):

Western Australia — near Boongarra, 17.x.1978, *Hnatiuk 780145* PERTH); Yanchepp National Park, 17.x.1963, *James 19* (PERTH); 18 km E. of Lancelin, 17.x.1981, *Keighery 4140* (PERTH); Bayswater, 6.x.1897, *Morrison s.n.* (E, K, MEL 1543881, PERTH); Capel, 18.ix.1949, *Royce 3122* (PERTH).

2. *Podotheca wilsonii* P. S. Short, sp. nov.

Herba annua. Axes majores ascendentes vel erecti, 7.5–45 cm longi, pilis stipitatis glandulis. *Folia* linearia vel lanceolata, 0.5–13.5 cm longa, 0.1–1.1 cm lata, apicibus saepe incurvatis, pilis stipitatis glandulis, viridia usque purpurea. *Capitula* obovoidea usque perlate obovoidea, raro ± oblonga, 1.5–3.5 cm longa, 0.7–3 cm diametro. *Bractae involucales* 26–75, ovatae usque lanceolatae, oblanceolatae, anguste trullati usque trullati, triangulares vel ± lineares, 7.6–24 mm longae, 1–5.5 mm latae; bractae exteriores herbaceae, pilis stipitatis glandulis, saepe marginibus angustis hyalinis pilis longis ciliatis ferentibus; bractae interiores hyalinae praeter costa opaca, glabrae. *Flosculi* 44–294, lutei; corolla tubus 14.5–25.1 mm longa. *Stamina* 5; antherae 1.96–2.46 mm longae, unaquaeque pollinibus *c.* 400–660. *Cypselae* 1.7–2.1 mm longae, 0.55–0.65 mm diametro. *Pappi setae* 5, laeves usque barbellatae in parte infera 1/3–1/2, in supera 1/2–2/3 subplumosae, plerumque albae vel luteolae sed interdum in supera 1/3 roseae.

HOLOTYPE: Hammersley Lakes, *c.* 16 km S. of Mt Jackson Homestead, *c.* 30° 18' S., 119° 01' E. In sand amongst samphire, *Atriplex* and *Frankenia*. 7.x.1983, *Short 1995* (MEL 689073). ISOTYPE: AD, BRI, CANB, CBG, HO, K, NSW, NT, PERTH.

Annual herbs. Major axes ascending to erect, 7.5–45 cm long, with stalked glandular hairs, purple. *Leaves* linear or lanceolate, 0.5–13.5 cm long, 0.1–1.1 cm wide, the apex often incurved, with stalked glandular hairs, green to purple. *Capitula* obovoid to very broadly obovoid, rarely ± oblong, 1.5–3.5 cm long, 0.7–3 cm diam. *Involueral bracts* 26–75 per capitulum, ovate to lanceolate, oblanceolate, narrowly trullate to trullate, triangular or ± linear, 7.6–24 mm long, 1–5.5 mm wide; outer bracts herbaceous, the surface with stalked glandular hairs, often with narrow hyaline margins with long-ciliate hairs; inner bracts hyaline except for the opaque midrib, glabrous. *Florets* 44–294 per capitulum, yellow; corolla tube 14.5–25.1 mm long. *Stamens* 5; anthers 1.96–2.46 mm long; microsporangia 1.45–1.88 mm long; apical appendages 0.35–0.62 mm long. *Pollen grains* *c.* 400–660 per anther. *Cypselae* 1.7–2.1 mm long, 0.5–0.6 mm diam. *Pappus* of 5 bristles, bristles smooth to barbellate in the lower 1/3–1/2, the upper 1/2–2/3 subplumose, commonly white or pale yellow but sometimes the upper *c.* 1/3 pink. (Fig. 4)

DISTRIBUTION (Fig. 1):

Western Australia. Occurs between latitudes *c.* 25° 30' S. and 31° 30' S. and longitudes 118° E. and 124° 30' E.

ECOLOGY:

Collectors' notes suggest that the species is restricted to saline, generally sandy soil. A single collection records that specimens were collected in a clay depression.



Fig. 4. Holotype sheet of *P. wilsonii* (Short 1995).

Notes include 'Growing in red-brown sand in open areas between shrubs of *Melaleuca*. On edge of salt lake' and 'In sand amongst samphire, *Atriplex* and *Frankenia*'.

NOTES:

1. The specific epithet honours Paul G. Wilson of PERTH.
2. Three of the thirteen collections examined contain plants in which the upper

part of the pappus bristles are pink. A single collection, *Demarz 4613*, has some specimens with pink bristles, others with yellow bristles.

3. *Podotheca wilsonii* has close affinities with *P. chrysantha* but the latter species has ten, rarely nine or eleven, bristles per floret, is always an erect herb and displays a preference for non-saline habitats.

SELECTED SPECIMENS SEEN (Total 13):

Western Australia — Lake Carey, 7.x.1973, *Demarz 4613* (PERTH); 41 miles N. of Bulga Downs, 24.ix.1975, *Demarz 5642* (PERTH); c. 16 km S. of Mt Jackson Homestead, 5.xi.1983, *Short 2298 & Haegi* (AD, MEL, PERTH); 30 km NE. of Nambi Homestead, 28.viii.1968, *Wilson 7482* (PERTH); southern margins of Lake Rason, 13.ix.1984, *Wilson 12117* (PERTH).

3. *Podotheca gnaphalioides* Grah., Bot. Mag. t. 3920 (1842); Steetz in Lehm. Pl. Preiss. 1: 449 (1845); Benth., Fl. Austr. 3: 601 (1867); Grieve & Blackall, W. Aust. Wildfls 824 (1975); Lander in Marchant *et al.*, Fl. Perth Region 699 (1987). — *Podosperma gnaphalioides* (Grah.) F. Muell., Fragm. 12: 22 (1882). TYPE: 'raised at the nursery garden of Messrs. James Dickson & Sons, Edinburgh, in spring, 1841, from a collection of Swan River seeds, communicated the year before by Mr. Murray, Lintrose . . . struck from cuttings by Mr. Kelly . . . of Messrs. Dickson's establishment.' LECTOTYPE (here chosen): *Anon. s.n.*, Swan River, cult., s. dat. (K). (See note 1 below.)

Lophoclinium manglesii Endl., Bot. Zeitung (Berlin) 1: 457 (1843). TYPE: 'Nova Hollandia austro-occidentalis'. POSSIBLE SYNTYPES AND ISOSYNTYPES: *Preiss 107*. LD, MEL 1543867 (ex herb. Sond.), MEL 691442 (ex herb. Steetz), P, W. (See note 2 under *P. angustifolia*.)

Podotheca pygmaea A. Gray, Hook. J. Bot. Kew Gard. Misc. 4: 227 (1851). TYPE: 'Swan River, Drummond'. LECTOTYPE (here chosen): *Drummond 64*, Swan River, N. Holl., s. dat. (K). (See note 2 below.)

Annual herbs. Major axes ± prostrate to erect, 6–55 cm long, with flat, septate, non-glandular hairs and often stalked glandular hairs, green to purple. *Capitula* ovoid to lanceoloid, 2–5 cm long, 0.3–1.5 cm diam. *Involucral bracts* 27–43 (c. 60) per capitulum, ± ovate to lanceolate or narrowly to linear triangular or ± oblanceolate or narrowly obtrullate, 8.6–36.7 mm long, 0.9–3.8 mm wide; outer bracts herbaceous, sometimes semi-succulent, dark green or purple green, usually with narrow, hyaline margins with long-ciliate hairs, the outer surface with flat, septate hairs and/or stalked, glandular hairs, rarely glabrous; inner bracts hyaline except for an opaque midrib, glabrous or with long-ciliate hairs on the margins. *Florets* 10–204 per capitulum, yellow or yellow-orange, corolla tube 20.7–30 mm long. *Stamens* 5; anthers 1.24–2.61 mm long; microsporangia 1.37–2.14 mm long; apical appendages 0.37–0.66 mm long. *Pollen grains* c. 300–500 per anther. *Cypselas* 1.9–2.7 mm long, 0.5–0.75 mm diam. *Pappus* of 5 bristles, each bristle usually smooth at the base, grading to plumose, sometimes barbellate or ± plumose near the base.

Chromosome number: $n = 13$ (Turner 1970).

DISTRIBUTION (Fig. 1):

South-west of Western Australia, including Dirk Hartog Island.

ECOLOGY:

Occurs in a variety of habitats and tends to favour sandy soils but has also been found growing in clay loam. It apparently has some salinity tolerance, with plants having been gathered on the edge of saline depressions. However it is generally restricted to areas above the samphire zone. Collectors' notes include: 'Growing in sand with *Melaleuca*, occasionally just extending to area with *Gunniopsis* on edge of saline depression', 'closed heath, shallow sand over limestone', 'open forest *Eucalyptus wandoo*, clay loam in drainage line', 'Open heath, orange-brown sandy loam over outcropping ferruginous sandstone', 'Sandplain with heath c. 2 m tall dominated by *Leptospermum* sp., *Casuarina cutivalvus* and *Acacia* spp.', 'In very

sandy loam on edge of granite outcrop' and 'mallee eucalypt - *Accacia* scrub, red-brown loam'.

NOTES:

1. It could be expected that type material examined by Graham is housed at E. However, a visit to E in August 1985 failed to reveal syntype material of *P. gnaphalioides*, there only being a photograph of the K specimen selected as the lectotype.

2. When describing *P. pygmaea* Gray referred to the 'whole plant scarcely above an inch high', suggesting that he had only seen a single specimen. The lectotype sheet contains two small plants. Despite this it seems that this is the material examined by Gray. The sheet is annotated with '*pygmaea n. sp.*' in his hand and no other possible type material has been located at GH (M. Canosa, *in litt.*, 1987) or any other herbarium.

3. *Podotheca gnaphalioides* is a polymorphic species in regard to its habit, which varies from prostrate to erect, and in the vestiture of the leaves and bracts. The most common form of the species has ascending to erect major axes and the outer involucre bracts have a vestiture of septate hairs and occasional, seemingly sessile or shortly stalked, glandular hairs (e.g. *Aplin 3362*, *Short 1602*, *Short 1722*). A few collections from drier and inland localities are of specimens with prostrate major axes and with bracts which are glabrous or with few septate hairs (e.g. *Blackall 453* from Sandstone). Other collections (e.g. *Willis s.n.* MEL 1555706, *Selk 1705*) are characterized by having bracts with a dense vestiture of stalked, glandular hairs as in *P. chrysantha* and *P. wilsonii*. Such specimens occur in the Jurien Bay-Yanchep region.

Formal recognition of the entities does not seem warranted but additional collections may prove otherwise.

SELECTED SPECIMENS EXAMINED (Total c. 120):

Western Australia — Dirk Hartog Island, 2.ix.1972, *George 11383* (PERTH); 15.5 km W. of Mullewa, 1.ix.1982, *Short 1602* (MEL, PERTH); Anderson Rocks, 13.ix.1982, *Short 1722* (MEL, PERTH); Caroling Rocks, 6.x.1983, *Short 1971* (MEL); E. edge of Lake Moore, 15.ix.1986, *Short 2930* (AD, MEL, PERTH).

4. *Podotheca pritzelii* P. S. Short, sp. nov.

Herba annua. Axes majores ascendentes vel erecti, c. 5–25 cm longi, pilis planis septatis. *Folia* lineari vel lanceolata 1–3.5 cm longa, 0.1–0.25 cm lata, succulenta, pallens viridia vel purpurascens, pilis planis septatis. *Capitula* ovoidea usque lanceoloidea vel cylindrica, 1.9–2.6 cm longa, 0.26–0.8 cm diametro. *Bracteae involucrealis* 15–32, ovatae usque lanceolatae vel anguste triangulares usque lineares triangulares vel obovatae usque oblanceolatae, 7.5–22 mm longae, 1.5–3.5 mm latae; bractae exteriores herbaceae, succulentae, pallentes virides vel purpureae, marginibus angustis hyalinis pilis longis ciliatis, pili septati absens; bracteae interiores hyalinae praeter costa opaca, glabrae. *Floresculi* 19–73; corolla tubes 14–19 mm longa. *Stamina* 5; antherae 1.4–1.83 mm longae, unaquaeque pollinibus c. 400. *Cypselae* 1.5–1.6 mm longae, 0.45–0.6 mm diametro. *Pappi setae* laeves usque barbellatae in parte infera 1/3–1/2, superae 1/2–2/3 plumosae.

HOLOTYPE: Lake Ninan, at junction of Brennan Road with the Wongan Hills-Yerecoin road. 30° 56' S., 116° 39' E. Growing in sand amongst samphire and *Melaleuca*. 25.x.1983, *Short 2214B* (MEL 1524328). **ISOTYPE:** AD, BRI, CANB, CBG, HO, K, NSW, PERTH.

Annual herbs. Major axes ascending to erect, 5–25 cm long, with flat, septate hairs. *Leaves* linear or lanceolate, 1–3.5 cm long, 0.1–0.25 cm wide, succulent, pale-green or purplish, with flat, septate hairs. *Capitula* ovoid to lanceoid or cylindrical, 1.9–2.6 cm long, 0.26–0.8 cm diam. *Involucre bracts* 15–32 per capitulum, ovate to lanceolate or narrowly to linear triangular or obovate to oblanceolate, 7.5–22 mm long, 1.5–3.5 mm wide; outer bracts herbaceous, succulent, pale green or purple, with narrow hyaline margins with long-ciliate hairs, flat septate hairs absent; inner bracts hyaline except for opaque midrib, glabrous. *Florets* 19–73 per capitulum, yellow-orange; corolla tube 14–19 mm long. *Stamens* 5; anthers 1.4–1.83 mm long; microsporangia 1.05–1.46 mm long; apical appendages 0.35–



Fig. 5. Holotype sheet of *P. pritzelii* (Short 2214B).

0.43 mm long. Pollen grains *c.* 400 per anther. Cypselas 1.5–1.6 mm long, 0.45–0.6 mm diam. Pappus of 5 bristles, each smooth to barbellate in the lower 1/3–1/2, the upper 1/2–2/3 plumose. (Fig. 5).

DISTRIBUTION (Fig. 1):

Western Australia. Only known with certainty from the vicinity of Wongan Hills. A collection, Gardner 7467, said to come from Lake Annean, Nannine, seems to be

erroneously labelled. The locality seems more likely to be Lake Ninan, the type locality. A further collection, *Kenneally 5799* from the Mortlock Flora Reserve and containing somewhat immature specimens, may be of this species.

Lake Ninan is in the Monger Lake System (Bettenay & Mulcahy 1972).

ECOLOGY:

The only ecological data available comes from the type collection (see above) which indicates that the species grows in saline sand amongst samphire and *Melaleuca*.

NOTES:

1. The specific epithet commemorates Ernst Georg Pritzel, a German botanist who, in 1900–1901, collected with Ludwig Diels in Western Australia. The first collection of this species was gathered by Pritzel.

2. In the field *P. pritzelii* is readily distinguished from *P. gnaphalioides*. The leaves and bracts are manifestly succulent and are usually a distinct pale green, although sometimes the bracts may be purple. Larger individuals frequently branch at the upper nodes, an uncommon feature in *P. gnaphalioides*. There is also a tendency for the largest capitula in *P. pritzelii* to be smaller than those of robust specimens of *P. gnaphalioides*, a situation reflected by the bract and floret number per capitulum. The bracts of this species also lack flat, septate hairs on the outer surface, an uncommon condition in *P. gnaphalioides*.

Differentiation of *P. pritzelii* from *P. gnaphalioides* can be difficult from herbarium specimens, a situation not helped when habitat notes are lacking. Although the pale green colour of the leaves and bracts may more or less remain the original succulent nature is often not apparent in dried specimens.

Apart from morphological differences *P. pritzelii* is found in a different habitat from that frequented by *P. gnaphalioides*. The latter species was not observed at Lake Ninan when the type collection of *P. pritzelii* was gathered. As noted above *P. gnaphalioides* barely encroaches into the samphire dominated zone of saline lakes (also see under *P. uniseta*).

SPECIMENS EXAMINED:

Western Australia — ?Lake Annean, Nannine, x.1945, *Gardner 7467* (PERTH); Wongan Hills, 13.x.1903, *Morrison 13058* (K, PERTH — 2 sheets); District Avon, in apertis arenosis, x.1901, *Pritzel 775* (BM, E, K, PERTH).

5. *Podotheca uniseta* P. S. Short, sp. nov.

Herba annua. Axes majores ascendentes vel erecti, c. 5–25 cm longi, pilis planis septatis. *Folia* linearia vel lanceolata, 1–4.5 cm longa, 0.1–0.35 cm lata, succulenta. *Capitula* anguste ovoidea vel cylindrica, 2–2.8 cm longa, 0.26–0.9 cm diametro. *Bracteae involucrealis* 23–35, ovatae usque lanceolatae vel anguste triangulares usque lineares triangulares vel lineares vel obovatae usque oblanceolatae, 4.5–22 mm longae, 0.6–3.2 mm latae; bracteae exteriores herbaceae interdum semisucculentae, marginibus angustis hyalinis pilis longis ciliatis, pili septati absens vel on bracteae eximae verticillus; bracteae interiores hyalinae praeter costa opaca, glabrae. *Flosculi* 26–67; corolla tubus 14.8–20.2 mm longa. *Stamina* 5; antherae 1.35–1.94 mm longae, unaquaque pollinibus c. 300–600. *Cypselae* 1.8–1.9 mm longae, 0.55–0.65 mm diametro. *Pappus* annulus seta uno, seta laevi vel barbellata in parte inferna 1/2–2/3, in supera 1/3–1/2 plumosa.

HOLOTYPE: E. edge of Lake Moore (c. 58 km from Paynes Find along Cleary road), 29° 40' S., 117° 43' E. Growing amongst *Gunniopsis* & *Halosarcia*. Sand. 15.ix.1986, *Short 2929* (MEL 689074). **ISOTYPE:** AD, BRI, CANB, HO, K, NSW, PERTH.

Annual herbs. Major axes ascending to erect, c. 5–25 cm long, with flat, septate hairs. *Leaves* ± linear or lanceolate, 1–4.5 cm long, 0.1–0.35 cm wide, succulent, green, red or purple. *Capitula* ± narrowly ovoid or ± cylindrical, 2–2.8 cm long, 0.26–0.9 cm diam. *Involucreal bracts* 23–35 per capitulum, ovate to lanceolate or narrowly to linear triangular or ± linear or ± obovate to oblanceolate, 4.5–22 mm long, 0.6–3.2 mm wide; outer bracts herbaceous, sometimes semisucculent, green or tinged purple, with narrow, hyaline margins with long-ciliate hairs, septate hairs

absent or only present on bracts of the outermost whorl; inner bracts hyaline except for opaque midrib, glabrous. *Florets* 25–67 per capitulum, mainly yellow but upper part of corolla tube usually purple; corolla tube 14.8–20.2 mm long. *Stamens* 5; anthers 1.35–1.94 mm long; microsporangia 0.97–1.59 mm long; apical appendages 0.28–0.49 mm long. *Pollen grains* c. 300–600 per anther. *Cypselas* 1.8–1.9 mm long, 0.55–0.65 mm diam. *Pappus* a basal annulus with a single bristle, the bristle smooth or barbellate in the lower 1/2–2/3, the upper 1/3–1/2 plumose. (Figs. 1b, 6).

DISTRIBUTION (Fig. 1):

Western Australia. Only known from the margins of Lake Monger, Lake Moore and a saline flat south of Morawa. All locations fall within the Avon drainage system as defined by Beard (1973).

ECOLOGY:

Commonly found in the samphire zone surrounding salt lakes. Collectors' notes include 'Sandy rise in samphire flat with other chenopodiaceous shrubs and scattered *Eremophila*. Sandy to very sandy pale red loam forming weak crust in places; coarse sand frequently on surface' and 'Growing amongst samphire c. 20 m above salt pan, just extending into *Melaleuca* shrub zone. In white sand.'

NOTES:

1. The single pappus bristle is the most distinctive feature separating this species from *P. gnaphalioides* and *P. pritzelii*. It is virtually indistinguishable from the latter on other features although the herbaceous bracts of *P. pritzelii* are more succulent and usually a bright green. The distinction of herbarium specimens of *P. gnaphalioides* from *P. uniseta* on morphological features other than the pappus seems untenable. However, distinct ecological differences have been observed where the two species occur in the same locality. At the type locality, where *P. uniseta* was observed to grow amongst samphire and *Gunnioopsis*, *P. gnaphalioides* (Short 2930) was recorded as primarily growing under *Melaleuca*. Only occasionally did it extend to the outer limits of the samphire zone where individuals of both species grew. In the field it is evident that plants of *P. uniseta* tend to be smaller, have more succulent bracts and are coloured a deeper purple than specimens of *P. gnaphalioides*. Putative hybrid individuals have never been observed at such sites.

SPECIMENS EXAMINED:

Western Australia — 93.5 km N. of Cleary, 13.xi.1983, *Haegi 2642 & Short* (AD, MEL, PERTH); Mongers Lake, 3.ix.1982, *Short 1634B* (AD, CANB, HO, NSW, PERTH); Mongers Lake, 23.x.1983, *Short 2179B* (MEL); 5 km S. of Morawa, 16.ix.1986, *Short 2960* (MEL, PERTH).

6. *Podotheca angustifolia* (Labill.) Less., Syn. gen. Compos. 272 (1832); DC., Prod. 6: 159 (1838); Steetz in Lehm. Pl. Preiss. 1: 448 (1845); Benth., Fl. Austr. 3: 601 (1867); Grieve & Blackall, W. Aust. Wildfls 824 (1975); Cooke in Jessop & Toelken, Fl. S. Aust. 3: 1573 (1986); Lander in Marchant *et al.*, Fl. Perth Region 700 (1987). — *Podosperma angustifolia* Labill., Nov. Holl. Pl. Sp. 2: 35, t. 177 (1806); J. M. Black, Fl. S. Aust. 1st ed. 636 (1929), 2nd ed. 914 (1957); W. M. Curtis, Stud. Fl. Tas. 341 (1963); J. H. Willis, Handb. Pl. Vict. 2: 719 (1973). — *Phaenopoda angustifolia* (Labill.) Cass., Dict. Sci. Nat. 42: 84 (1826). TYPE: 'Habitat in terra Van-Leuwin.' SYNTYPES: FI (n.v.), P. (see note 1 below).

Lophoclinium citrinum Endl., Bot. Zeitung (Berlin) 1: 457 (1843). TYPE: 'Nova Hollandia austro-occidentalis'. POSSIBLE SYNTYPES & ISOSYNTYPES: *Preiss 106*, LD, MEL 1543637 (ex herb. Steetz), MEL 1543638 (ex herb. Sonder), MEL 691441, P (3 sheets), W (2 sheets). (See note 2 below.)

Annual herbs. Major axes ascending to erect, 2–30 cm long, sometimes cottony, always with some flat, septate, non-glandular hairs and short, usually conspicuously stalked, glandular hairs. *Leaves* ± linear, lanceolate or oblanceolate, 0.6–3(9) cm long, 0.1–0.3(0.7) cm wide, with flat, septate, non-glandular hairs and stalked glandular

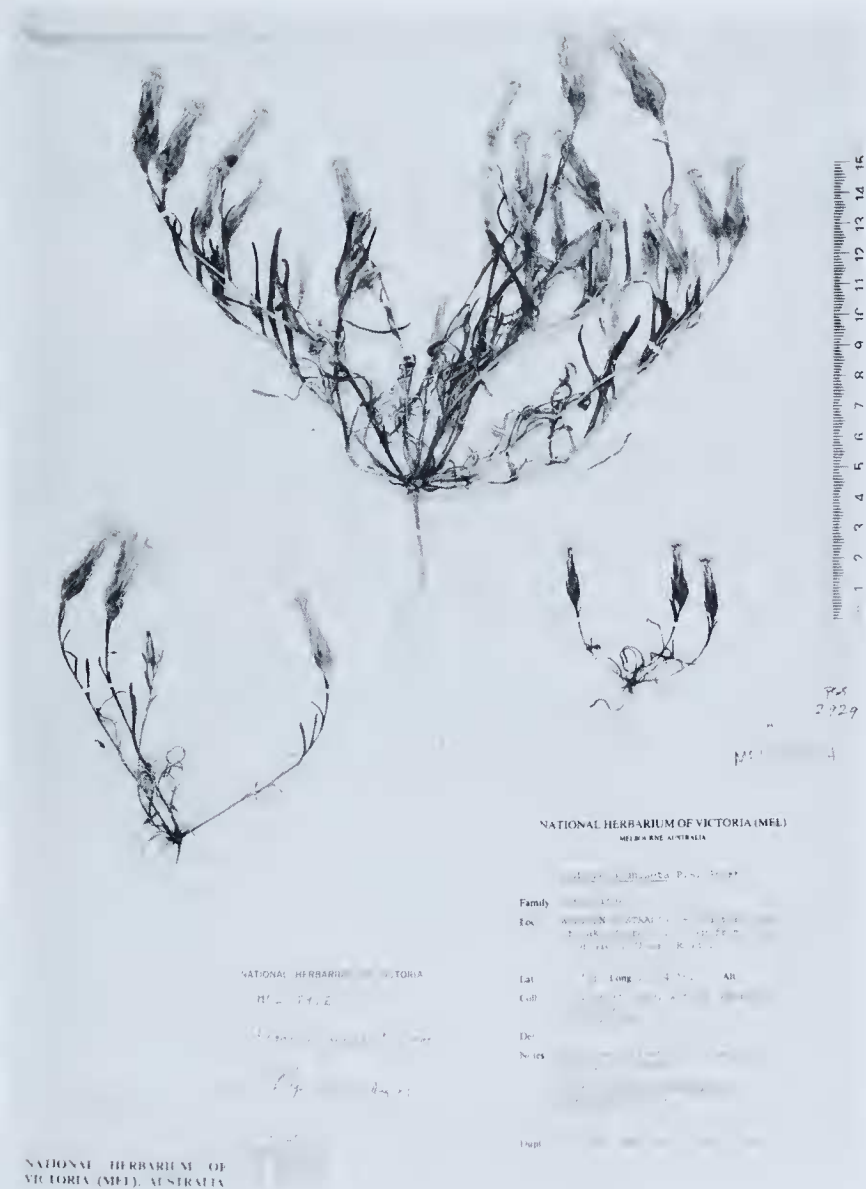


Fig. 6. Holotype sheet of *P. uniseta* (Short 2929).

nairs, sometimes \pm succulent. *Capitula* ovoid to lanceoloid or \pm cylindrical, 1.2–4.5 cm long, 0.3–1.2 cm diam. *Involucral bracts* 14–28 per capitulum, ovate to lanceolate or narrowly triangular to linear triangular or \pm linear, 7–28 mm long, 1–3 mm wide; outer bracts herbaceous, sometimes \pm succulent, green to purple, usually with narrow hyaline margins with long-ciliate hairs, the margins not extending to the usually recurved apex, the outer surface with flat, septate hairs and some glandular hairs; inner bracts hyaline except for an opaque midrib, glabrous or with long-ciliate hairs on the margin. *Florets* 9–73 per capitulum, usually yellow but the upper part of the corolla tube often purple; corolla tube 14–21 mm long. *Stamens* 5; anthers 0.65–1.15 mm long; microsporangia 0.33–0.82 mm long; apical appendages 0.23–0.46 mm long. *Pollen grains* 20–60 per anther. *Cypselas* 2.2–4 mm long,

0.4–0.7 mm diam. *Pappus* of 5 bristles, each bristle smooth at the base, grading to plumose in the upper 1/2–2/3.

Chromosome numbers: $n = 13,26$ (Turner 1970).

DISTRIBUTION (Fig. 1):

Western Australia (south of a line extending from Pt Quobba through Menzies to the south coast and including islands such as Rottnest Island and North Island and West Wallabi Island in Houtman Abrolhos), South Australia (S. of c. 30° S.), south-west New South Wales, Victoria and islands of Bass Strait.

ECOLOGY:

Occurs in an array of coastal and inland habitats. Collectors' notes include 'Open scrub . . . dominated by *Leucopogon parviflorum*, in swale near inland margin of dunes', 'in open *Melaleuca cuticularis* swamp . . . in low lying winter wet grey sandy clay with clay subsurface', 'Calcareous soils. *Agonis flexuosa* open woodland', 'on white sand ridge between trees of *Casuarina*', 'in sandy loam amongst *Melaleuca* trees immediately above saline depression and extending into open salmon gum woodland with an understorey of *Atriplex*, *Eremophila*, *Olearia* and *Acacia* shrubs. Sometimes growing with *P. gnaphalioides*', 'Open scrub . . . *Banksia* – *Acacia*, deep sandy silt', 'Moderately exposed base of small granite mountain. Variable-drained, shallow, arkosic loamy sand' and 'sand ridge with low mallee eucalypts and *Callitris*. Associated herbs include *Gnaphalium* sp. & *Waitzia acuminata*'.

NOTES:

1. Type material of *P. angustifolia* is presumably held at FI but is not available for loan. Both the description and illustration leave little doubt as to the application of the name. A single specimen in P is probably syntype material. It was at one time in the herbarium of E. Drake and is labelled in an unknown hand as having been collected by Labillardière. It consists of a single capitulum and dissection of one of several poorly preserved florets revealed anthers barely 1.1 mm long. The original illustration shows a plant in which the capitula are somewhat open and in this respect the P specimen is also a good match.

A further specimen in P attributed to the D'Entrecasteaux expedition and said to be of *P. angustifolia* is considered to be erroneously labelled. It is not a match for Labillardière's description or illustration and in fact is of *P. gnaphalioides*. The notion that the label is incorrect is supported by the fact that the D'Entrecasteaux expedition, of which Labillardière was a member, explored the southern coastline of Western Australia. *P. gnaphalioides*, unlike *P. angustifolia*, barely encroaches upon the southern coast.

2. Endlicher (1843) described the genus *Lophoclinium* and included in it three species, i.e. *L. manglesii* Endl., *L. citrinum* Endl. in [sect.] *Lophoclinium* (as '*Eulophoclinium*') and *L. album* Endl. in [sect.] *Brachycallyma* Endl. (Endlicher did not indicate the rank of the infrageneric names.) It follows that *Lophoclinium* should be lectotypified by *L. manglesii* or *L. citrinum*, but due to uncertainty as to the typification of both names, neither has been chosen.

Endlicher, apart from indicating that the species were from 'Nova Hollandia austro-occidentalis', gave no information pertaining to the identity of the specimens and their collector(s). Bentham (1867) reduced *L. manglesii* to synonymy under *P. angustifolia* and *L. citrinum* was placed under *P. gnaphalioides*. He also suggested that *L. album* was conspecific with *P. fuscescens* but was clearly uncertain as to its identity. Specimens from W have been examined and it seems that both *L. manglesii* and *L. citrinum* were described from specimens gathered in Western Australia by Ludwig Preiss. Thus single specimens of both *Preiss 106* (of *P. angustifolia* and collected from Rottnest Island) and *Preiss 107* (of *P. gnaphalioides* and from Lake Mathilda) are labelled, in what I suspect is Enlicher's hand, as *L. citrinum* and *L. manglesii* respectively. The labels were compared with a sample of Endlicher's handwriting contained in a file compiled by Mr A. Court and housed at MEL. However, I have some doubts as to the handwriting on the *Preiss* collections. It is not too dissimilar to

that of Lehmann. Furthermore, if the Preiss collections are syntypes then the application of the names *L. citrinum* and *L. manglesii* differ from that applied not just by Bentham but, as evident from determinations on sheets in W, by other botanists. Because of such doubts I have refrained from selecting lectotypes of both names, merely suggesting that the Preiss collections are syntypes or isosyntypes.

The application of the name *Lophoclinium album* remains unresolved as no specimens bearing this name arrived with the loan of *Podotheca* from W. However, it is clear that this name does not apply to members of *Podotheca s. str.* as the plant was described as having a single row of involucre bracts and white florets, each with a pappus of about 15 bristles.

SELECTED SPECIMENS EXAMINED (Total c. 320)

- Western Australia — 4.7 km E. of Yellowdine, 18.ix.1982, *Short 1752* (MEL); 16.5 km SW. of Nannup, 1.xi.1983, *Short 2268 & Haegi* (AD, MEL, PERTH).
 South Australia — Dangkali Conservation Park, 12.xi.1980, *Conn 910* (AD); W. of Lake Newland, 12.x.1967, *Donner 2448* (AD).
 New South Wales — 5.5 km N. of Wentworth–Renmark Rd on road to Belmore, 10.ix.1980, *Christensen 54* (AD).
 Victoria — King Island, xi.1887, *French s.n.* (MEL 1543649).

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